

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

1. A suturing device comprising:
 - a handle;
 - an elongated shaft attached to said handle; and
 - a sharpened tip on said elongated shaft, said sharpened tip configured to trap a suture at a selected point.
2. A suturing device as defined in claim 1, wherein said sharpened tip includes an opening configured to trap a suture at a selected point.
3. A suturing device as defined in claim 2, wherein at least a portion of the opening is dimensioned to wedge and hold a suture in the selected position.
4. A suturing device as defined in claim 3, wherein said opening comprises a central portion which has a tapered configuration.
5. A suturing device as defined in claim 2, wherein said opening comprises a tapered opening.
6. A suturing device as defined in claim 2, wherein said opening comprises an elongated opening.
7. A suturing device as defined in claim 6, wherein at least a portion of said elongated opening is curved.
8. A suturing device as defined in claim 1, wherein said sharpened tip includes an opening; and
 - a locking mechanism having at least a locked position and an unlocked position, said locking mechanism when in said locked position being configured to trap a suture in said opening.
9. A suturing device as defined in any of claims 2-8, wherein the suture comprises a length of material, and wherein said opening is configured to allow the suture to pass lengthwise through said opening.
10. A suturing device as defined in claim 9, wherein said opening is further configured to allow the suture to be side-loaded into said opening.

11. A suturing device as defined in claim 1, wherein said sharpened tip includes an opening into which a suture can be inserted, and wherein said opening is configured to allow the suture to be side loaded into said opening.

12. A suturing device as defined in claim 1, wherein said sharpened tip has a hooked configuration.

13. A suturing device as defined in claim 1, wherein said sharpened tip is angularly bent relative to said shaft in a selected direction.

14. A suturing device as defined in claim 1, wherein said sharpened tip is configured with at least one spiral loop at the distal end of the shaft.

15. A suturing device as defined in claim 1, wherein said sharpened tip is bent so the distal tip generally points towards the proximal end of the shaft.

16. A suturing device as defined in claim 1, wherein said sharpened tip is curved at least partially about the distal end of the shaft.

17. A suturing device as defined in claim 1, wherein said sharpened tip extends at an angle and to one side of the distal end.

18. A suturing device as defined in claim 1, wherein said sharpened tip extends at least partially forward from the distal end with a concave configuration.

19. A suturing device as defined in claim 1, wherein said sharpened tip extends substantially straight and forward from said distal end.

20. A suturing device as defined in claim 1, wherein said sharpened tip is selectively moveable relative to said shaft.

21. A suturing device as defined in claim 1, wherein said sharpened tip is selectively detachable from said shaft.

22. A suturing device comprising:

a handle;

an elongated shaft attached to said handle at a proximal end of said shaft; and

a detachable needle at a distal end of said elongated shaft, said needle having a suture attached thereto.

23. A suturing device as defined in claim 22, wherein said distal end has a hooked configuration.
24. A suturing device as defined in claim 22, wherein said distal end is angularly bent relative to said shaft in a selected direction.
25. A suturing device as defined in claim 22, wherein said distal end is configured with at least one spiral loop at the distal end of the shaft.
26. A suturing device as defined in claim 22, wherein said distal end is bent so the distal tip generally points towards the proximal end of the shaft.
27. A suturing device as defined in claim 22, wherein said distal end is curved at least partially about the distal end of the shaft.
28. A suturing device as defined in claim 22, wherein said distal end extends at an angle and to one side of the distal end.
29. A suturing device as defined in claim 22, wherein said distal end extends at least partially forward from the distal end with a concave configuration.
30. A suturing device as defined in claim 22, wherein said distal end extends substantially straight and forward from said distal end.
31. A suturing device as defined in claim 22, wherein said needle and suture are detachably affixed to said suturing device by threading the suture through a portion of said suturing device.
32. A suturing device as defined in claim 22, wherein said needle and suture are detachably affixed to said suturing device by threading the suture through at least the distal end and the shaft of said suturing device.
33. A suturing device as defined in claim 22, wherein said needle and suture are side-loaded into said suturing device.
34. A suturing device comprising:
 - a handle;
 - an elongated shaft attached to said handle at a proximal end of said shaft;
 - a sharpened tip at a distal end of said elongated shaft; and

5 a tissue support device disposed adjacent said sharpened tip, configured
6 to move relative to said sharpened tip to facilitate penetration of said sharpened tip
7 through a tissue.

35. A suturing device as defined in claim 34, wherein a suture is connected with said sharpened tip and moves with the sharpened tip as the sharpened tip penetrates through the tissue.

36. A suturing device as defined in claim 34, wherein a suture is connected with said tissue support device, and is located to be engaged by said sharpened tip as said sharpened tip is withdrawn from the tissue.

37. A method of delivering a suture comprising:

 providing a suture device;
 releasably coupling a suture with the distal end of said suture device;
 penetrating a substrate with the distal end of said suture device such that said suture is partially passed through the substrate; and
 releasing the suture from said suture device.

38. A method as defined in claim 37, wherein said step of releasably coupling a suture with the distal end of said suture device comprises releasably trapping the suture in an opening at the distal end of said suture device.

39. A method as defined in claim 37, wherein the opening is configured to trap and hold a suture, and said step of releasably coupling comprises releasably trapping and holding the suture in the opening.

40. A method as defined in claim 37, wherein a locking mechanism associated with the opening has a locked position in which it releasably traps the suture in the opening, at least a portion of the suture being disposed in the opening, and said step of releasably coupling comprises placing said locking mechanism in its locked position.

41. A method as defined in any of claims 38 through 40, wherein said step of releasably coupling comprises the step of side-loading the suture into the opening.

42. A method as defined in claim 37, wherein the distal end of said suture device is selectively adjustable relative to the suture device.

43. A method as defined in claim 37, wherein the distal end of said suture device is selectively detachable from the suture device.

44. A method as defined in claim 43, wherein a differently shaped distal end may be attached to the distal end of said suture device.

45. A method as defined in claim 37, wherein a detachable needle is disposed at the distal end of the suture device, said needle having a suture attached thereto, and wherein said step of penetrating a substrate with the distal end of the suture comprises penetrating the substrate with said detachable needle.

46. A method as defined in claim 37, wherein a second penetrating step is performed through said substrate with said distal end of said suture device prior to said releasing step.

47. A method as defined in claim 37, wherein the distal end comprises a sharpened tip, a tissue support device is disposed adjacent the sharpened tip, and said step of penetrating a substrate comprises locating the tissue support device adjacent a selected portion of tissue and moving the sharpened tip relative to the tissue support device to facilitate penetration of the sharpened tip through the selected portion of tissue.

48. A method as defined in claim 47, wherein a suture is connected with the sharpened tip and moves with the sharpened tip as the sharpened tip penetrates through the tissue.

49. A method of delivering a suture comprising:

providing a suturing device having a sharpened tip configured to penetrate a tissue, a tissue support device disposed to be located adjacent a selected portion of tissue, and being moveable relative to the sharpened tip to facilitate penetration of the sharpened tip through the selected portion of tissue and to enable the sharpened tip to be withdrawn from the selected portion of tissue;

providing a suture disposed to be engaged by the sharpened tip as the sharpened tip is being withdrawn from the selected portion of tissue;

locating the tissue support device adjacent a selected portion of tissue and moving the sharpened tip relative to the tissue support device to pierce the selected

portion of tissue, and engaging the suture with the sharpened tip as the sharpened tip is withdrawn from the selected portion of tissue; and

releasing the suture from the sharpened tip after the sharpened tip has been withdrawn from the selected portion of tissue.

50. A method as defined in claim 49, wherein the step of moving the sharpened tip relative to the tissue support device comprises rotating the tissue support device and the sharpened tip relative to each other so that the sharpened tip rotates towards the tissue support device as the sharpened tip pierces the tissue and rotates away from the tissue support device as the sharpened tip is withdrawn from the selected portion of tissue, and engaging the suture with the sharpened tip and drawing the suture through the selected portion of tissue as the sharpened tip rotates away from the tissue support device and is withdrawn from the selected portion of tissue.

51. A suturing device comprising:

a handle;

an elongated shaft attached to said handle;

a sharpened tip on said elongated shaft,

said sharpened tip being configured to engage a suture; and

a locking mechanism having at least a locked position and an unlocked position, said locking mechanism when in said locked position being configured to hold the suture in a selected position.

52. A suturing device as defined in claim 51, wherein said locking mechanism has at least one partially closed position for capturing the suture and for controlled adjustment of the suture relative to the sharpened tip.

53. A suturing device comprising:

a handle;

an elongated shaft attached to said handle;

a sharpened tip on said elongated shaft,

said sharpened tip having an opening configured to allow the suture to be side-loaded onto said device.

54. A suturing device as defined in claim 53, wherein said opening comprises a tapered opening.

55. A suturing device comprising:

a handle;

an elongated shaft attached to said handle;

a sharpened tip on said elongated shaft,

said sharpened tip having a piercing portion configured to pierce tissue during a suturing procedure; and

a suture coupled with said sharpened tip, said suture having a suture portion extending outward from said sharpened tip to permit said suture to be grasped and manipulated relative to said sharpened tip, said suture portion disposed to be carried by the sharpened tip through tissue which has been pierced by said piercing portion.